

AMENDMENT TO THE DRAWING(S)

Figs. 29 and 32 have been amended. The attached sheets of formal drawings replace the original sheets including Figs. 29 and 32.

REMARKS/ARGUMENT

In the most recent Office Action, claims 1-153 were examined. Claims 1-12, 45-63 and 152-153 are withdrawn from consideration. Claims 38 and 42-44 are allowed. Claims 19-20, 32-33, 35-37, 64-65, 117-126 and 132-146 are objected to. Claims 13-18, 21-31, 34, 39-41, 66-116, 127-131 and 147-151 are rejected. Claims 13-44 and 64-151 are amended. Accordingly, claims 1-153 are pending in the application. No new matter is added.

Applicants thank the Examiner for the thorough search and consideration of the present application, and respond to the comments in the Office Action as follows.

Drawings

The drawings are objected to for having mis-labeled figure numbers. Applicants have corrected the drawings and submit herewith new formal drawings of the corrected figures for entry in the application. Reconsideration and withdrawal of the objection is respectfully requested.

Abstract

The Office Action states that the abstract of the disclosure is objected to because it should recite only the elected invention. Applicants submit herewith a revised abstract for consideration in the application. Reconsideration and withdrawal of the objection to the abstract is respectfully requested.

Specification

The Office Action states that the specification is objected to for informalities in the Brief Description of the Drawings. Applicants have corrected the Brief Description of the Drawings in the specification to overcome the objection. Applicants respectfully request that the objection accordingly be reconsidered and withdrawn.

Objections to the Claims

The Office Action states that claims 14, 19-20, 65, 71-75 and 122-126 are objected to for minor informalities. Applicants have amended the claims to clarify the language and overcome the objection. Accordingly, Applicants respectfully request that the objection to the claims be reconsidered and withdrawn.

Claim Rejections - 35 U.S.C. §112

The Office Action states that claims 21-23, 29, 34, 39-41, 66-80, 106, 127-131 and 147-151 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicants regard as the invention. In particular, the Office Action states that particular terms in the claims lack antecedent basis, and several terms used in equations in the claims are undefined.

Applicants have amended the claims to clarify the language of the claims and overcome the rejection. Applicants respectfully submit that the claims now recite the subject matter of the invention with a reasonable degree of certainty to permit one of ordinary skill in the art to understand the invention. Accordingly, Applicants respectfully request that the rejection of the claims under 35 U.S.C. §112, second paragraph be reconsidered and withdrawn.

Claim Rejections - 35 U.S.C. §102

The Office Action states that claims 13-15, 21-23, 28, 30, 66-67, 71-72, 76-77, 101-102 and 107-108 are rejected under 35 U.S.C. §102(b) as being anticipated by Veselka et al. (IEEE Photonics Technology Letters, July 1998). In particular, the Office Action states that Veselka et al. disclose all the elements recited in the rejected claims. The rejection is respectfully traversed.

Veselka et al. appear to disclose a single Mach-Zehnder modulator used to generate a periodic amplitude modulation on the CW light from the DFB laser. The dispersion shifted fiber shown by Veselka et al. causes the modulated light to undergo additional modulation through self phase modulation.

In contrast, the present invention calls for a plurality of modulating means arranged in the plurality of optical paths. This limitation is not shown by Veselka et al. Accordingly, Applicants

respectfully believe that claim 13 recites limitations that are not shown in the cited prior art reference. Applicants therefore respectfully submit that the rejection of claim 13 under 35 U.S.C. §102(b) is overcome, and respectfully requests that it be reconsidered and withdrawn. Claims 14-15, 21-23, 28, 30, 66-67, 71-72, 76-77, 101-102 and 107-107 depend upon and further limit claim 13, and are thought to be allowable for the same reasons as claim 13, in addition to the further limitations recited in each claim. Accordingly, Applicants respectfully request that the rejection of those claims under 35 U.S.C. §102(b) be reconsidered and withdrawn.

The Office Action further states that claim 13 is rejected under 35 U.S.C. §102(b) as being anticipated by Okazaki et al. (U.S. Patent No. 5,436,757). In particular, the Office Action states that Okazaki et al. teach a series of phase modulators coupled between input and output sections of an optical waveguide, with voltage applying means that independently regulates the signal voltage applied to the modulators. The rejection is respectfully traversed.

Okazaki et al. appears to teach an optical wavelength converting apparatus with a plurality of periodic domain inverted structures in a waveguide. In the periodic domain inverted structure, the so-called pseudo phase matching is achieved between the laser beam and its second harmonic (col. 5, lines 41-48). Alternatively, the pseudo phase matching is achieved between two fundamental waves (col. 5, lines 48-54). The described periodic domain inverted structure does not generate a multi wavelength light using phase modulation, as does the present invention recited in claim 13. Because claim 13 recites elements that are not taught by Okazaki et al., Applicant respectfully submits that the rejection of claim 13 under 35 U.S.C. §102(b) over Okazaki et al. is overcome, and respectfully requests that it be reconsidered and withdrawn.

Claim Rejections -35 U.S.C. §103

The Office Action states that claims 16-18, 24-27, 31, 68-70, 73-75, 78-100, 103-105 and 109-116 are rejected under 35 U.S.C. §103(a) as being unpatentable over Veselka et al. In particular, the Office Action states that one of ordinary skill in the art would arrive at the present invention recited in the rejected claims based on the phase modulation, or amplitude and phase modulation disclosed by Veselka et al. The rejection is respectfully traversed.

As noted above, Veselka et al. appear to disclose a dispersion shifted fiber to obtain self phase modulation. Veselka et al. fail to teach or suggest phase modulation in the Mach-Zehnder

modulator, and only refer to the generation of periodic amplitude modulation on the CW light.

In contrast, Applicants call for a phase modulator in the optical modulating means or a phase modulator that performs phase modulation and amplitude phase modulation concurrently. Accordingly, Veselka et al. do not teach or suggest the present invention recited in the rejected claims. Accordingly, Applicants respectfully believe that the rejection of claims 16-18, 24-27, 31, 68-70, 73-75, 78-100, 103-105 and 109-116 under 36 U.S.C. §103(a) is overcome, and respectfully requests that it be reconsidered and withdrawn.

The Office Action further states that the use of other equivalent light amplitude modulators, such as electro-absorption intensity modulators, would have been obvious. However, as noted above, because Veselka et al. do not teach or suggest phase modulation in the Mach-Zehnder modulator, it would not have been obvious to use other light amplitude modulators because of phase modulation called for in the respective claims. Similarly, the biasing arrangement called for in the claims of the present application would not have been obvious to one of ordinary skill in the art based on the teachings of Veselka et al. Indeed, the biasing arrangement recited in the claims of the present invention is not taught or suggested by Veselka et al. Furthermore, multiplying the signal voltage of the predetermined period is not taught or suggested by Veselka et al., especially where a multiplied signal voltage regulates a voltage applied to the modulating section, as is recited in the claims of the present invention. Accordingly, Applicants respectfully submit that the disclosure by Veselka et al. does not teach or suggest all of the claimed limitations in the claims presently rejected under 35 U.S.C. §103(a), and submit that for at least that reason the rejection should be withdrawn.

Allowed Claims

Applicants gratefully acknowledge the allowance of claims 38 and 42-44. Applicants further gratefully acknowledge the allowability of claims 19-20, 32-33, 35-37, 64-65, 117-126 and 132-146, if those claims are rewritten in independent form to include all the limitations of the base claim and any intervening claims, and to overcome any objections raised in the Office Action. Applicants respectfully believe that these claims are now allowable, as being based upon an allowable independent claim, and respectfully requests notice of allowability for these claims.

Conclusion

Applicants respectfully believe that the present response addresses all issues raised in the most recent Office Action. Applicants further believe that, in view of the above discussion and amendments, the application is now in condition for allowance, and earnestly solicits notice to that effect. If it is believed that an interview would contribute to progress in the application, the Examiner is requested to contact the undersigned counsel at the number provided below.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on January 30, 2004

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January 30, 2004
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Respectfully submitted,

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